

between scarce units of resource, will paradoxically lead to a reaffirmation that the professional's duty is to the individual patient.

#### The specialist's role at the margin of knowledge

What characterises specialists is, to borrow an economic concept, their ability at the margin of knowledge. This cannot be replaced by semitrained nurses or physician assistants or by championing generalists as economic gatekeepers.

The scenario that I have sketched may not happen. Most empirical evidence suggests that it would be an expensive way to provide health care. But consumerism

and ever more information about the potential benefits of medical intervention will forge an alliance directly between physicians and patients (real rather than proxy purchasers), resulting in pressure for increased specialist care. Technical advance will drive demand, and the priests that tend the machines will increase in number, as will the number of their sects. Alternatives of course do exist.

My treatment of the ethics of a humane medicine owes much to the ideas advanced in *Science and Human Values* (Hutchinson, London 1961) and *A Sense of the Future: Essays in Natural Philosophy* (MIT Press, Cambridge, Massachusetts 1977), both by Jacob Bronowski.

## Guidelines on appropriate indications for upper gastrointestinal endoscopy

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**Upper gastrointestinal endoscopy is a valuable diagnostic tool, but for an endoscopy service to be effective it is essential that it is not overloaded with inappropriately referred patients. A joint working party in Britain has considered the available literature on indications for endoscopy, assessed standard practice through a questionnaire, and audited randomly selected cases using an independent panel of experts and an American database system. They used these data to produce guidelines on the appropriate and inappropriate indications for referral for endoscopy, although they emphasise that under certain circumstances there may be reasons to deviate from the advice given. The need for endoscopy is most difficult to judge in patients with dyspepsia, and this aspect is discussed in detail. Early endoscopy will often prove more cost effective than delaying until the indications are clearer.**

is appropriate should be referred. A joint committee of the Royal College of Physicians of London, Royal College of Surgeons of England, Royal College of Anaesthetists, Association of Surgeons, the British Society of Gastroenterology, and the Thoracic Society of Great Britain has been auditing gastrointestinal endoscopy in England. On the recommendations of that committee a working party was set up to determine the appropriate indications for endoscopy. This report details the findings of the working party.

#### Methods

The working party did a systematic manual search and a Medline search of literature published on the appropriateness and inappropriateness of indications for endoscopy since 1981. The epidemiology of upper gastrointestinal disease in the United Kingdom was specifically considered because the prevalence and types of dyspeptic disease differ widely throughout the world. In this report dyspepsia is defined as upper abdominal or retrosternal pain, discomfort, heart burn, nausea, vomiting, or other symptom considered to originate from the proximal alimentary tract.<sup>1</sup> Heart burn is defined as an intermittent burning pain felt in the retrosternal area often but not always associated with a feeling of gastro-oesophageal regurgitation and typically relieved by taking antacids.

We also assessed current practice in Britain in two ways. We sent 1297 questionnaires to a random selection of doctors comprising 350 general physicians, 400 surgeons, 477 gastroenterologists, and 70 general practitioners.<sup>8</sup> Questions were asked in the form of a brief clinical scenario to which the doctors had to reply whether or not they would usually refer for endoscopy.

An audit panel of seven judges (physicians and surgeons with an interest in gastroenterology) assessed 390 cases randomly selected by the audit coordinator from four endoscopy units throughout East Anglia (three in district general hospitals and one in a teaching hospital). The cases represented one month's work for these units. The cases were also assessed independently for appropriateness by using an American database last revised in January 1989.<sup>9</sup> The methods and results of the questionnaire and assessment have been published<sup>8</sup> and form the basis of this report.

Appropriateness was defined as follows.<sup>10</sup> For a procedure to be appropriate its expected benefit should be greater than its expected negative consequences by

#### Introduction

Most patients referred for endoscopy complain of symptoms that come under the general heading of dyspepsia.<sup>1-5</sup> Gastrointestinal symptoms are responsible for about 10% of the work of general practitioners,<sup>6</sup> with upper abdominal symptoms (principally dyspepsia) accounting for about half. The severity and frequency of symptoms alone does not predict the likelihood of consultation, however; concerns about the meaning of symptoms, particularly in terms of malignancy and heart disease, play an important part in determining whether a patient consults. This is reflected in the finding that dyspeptic patients with negative findings on endoscopy have greatly reduced consultation and prescribing rates after the procedure.<sup>7</sup>

The diseases most commonly sought by endoscopy are reflux oesophagitis (and its complications), oesophageal varices, oesophageal cancer, gastric ulcer, gastric cancer, duodenal ulcer, and coeliac disease. The main purpose of the investigation is to identify the cause of symptoms in order to start suitable treatment. A secondary reason is to exclude organic upper gastrointestinal disease so that further investigations can be undertaken to identify the cause of symptoms or alternatively the patient and clinician can be reassured that no serious disease is present.

For endoscopy services to be used to their best advantage only those patients for whom the procedure

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BMJ 1995;310:853-6

a sufficiently wide margin to make the procedure worth doing. Both benefits and negative consequences are defined in the broadest terms. Therefore, in addition to reduced mortality and morbidity, benefits included reduced anxiety, pain, and time lost from work. Similarly, negative consequences included the risk of a false positive result (if the procedure under review is a diagnostic study) and the pain and anxiety caused by the procedure as well as its direct mortality and morbidity.

#### Results of questionnaire and assessments

Table I shows the results of the questionnaire. The response rate was 66%. The proportions of doctors who would request endoscopy in the various clinical situations varied from 4.5% to 99%. Although there was a wide range of opinion as to which patients are appropriate for endoscopy, agreement was good for the most and least serious clinical situations.

No difference was found in the referral pattern among the four endoscopy units from which the 390 cases were selected for further assessment. The audit panel considered 321 (82%) to have been appropriate referrals and 45 (12%) inappropriate; in 24 (6%) the indication was equivocal. No serious disease would have been missed by the panel. However, the American software system considered 120 (30%) of the referrals to have been inappropriate. With hindsight the computer system would have missed one gastric cancer, three duodenal ulcers, and two gastric ulcers (serious disease being missed in 5% of the patients identified as inappropriately referred). The commonest cause of inappropriateness found by the computer was that the patient had not had adequate formal antiulcer treatment. British doctors seem less likely than their American counterparts to defer endoscopy until a antiulcer treatment has been tried. The audit panel was more likely to label a case inappropriate when a clear history of irritable bowel disease or a chronic functional disorder was described.

#### Circumstances appropriate for endoscopy

From the published data, standard practice, and the results of the questionnaire, the audit panel, and American database analysis the working party identified specific indications or symptoms that usually indicate the need for endoscopy (box 1). These

#### Box 1—Symptoms or indications for which endoscopy is usually appropriate

Gastrointestinal bleeding  
Unexplained iron deficiency anaemia  
Positive occult blood test result  
Dysphagia (food sticking)  
Odynophagia (painful swallowing)  
Severe upper abdominal pain  
Moderate, long standing upper abdominal pain  
Recurrent vomiting  
Unexplained weight loss  
Severe heart burn  
"Suspicious" barium meal result  
Gastric ulcer  
Check gastric ulcer for healing  
Achalasia  
Suspected coeliac disease

indications account for a relatively small proportion of patients referred for endoscopy. Most present with non-specific upper abdominal symptoms, and it is subdivision of this group that is most likely to identify those who are inappropriately referred for endoscopy. Those circumstances in which endoscopy would be appropriate for patients with dyspepsia are described below and in box 2.

#### Box 2—Appropriate and inappropriate indications for endoscopy in patients with dyspepsia

##### Appropriate

Any patient over the age of 45 with recent onset of dyspeptic symptoms or change in dyspeptic symptoms  
Patients under the age 45 with dyspepsia who are positive for *Helicobacter pylori* on non-invasive testing or who have other risk factors such as treatment with non-steroidal anti-inflammatory drugs  
Patients in whom continuous long term treatment with H<sub>2</sub> receptor antagonists, acid pump inhibitors, or prokinetic drugs is planned  
Patients under the age of 45 with severe and persistent symptoms that do not respond to treatment

##### Inappropriate

Patients of any age who have typical symptoms of irritable bowel syndrome rather than dyspepsia  
Patients with mild or moderate reflux symptoms which respond to simple measures such as change in lifestyle, antacids, and alginates  
Patients known to have duodenal ulcer who are responding to treatment  
Patients who have had a single episode of dyspepsia and are now asymptomatic and not receiving treatment

TABLE I—Numbers of doctors who would request endoscopy in various clinical situations

Indication	No(%) of doctors* (n=856)
Asymptomatic sliding hiatus hernia seen on barium meal	37 (4.5)
Patient under 40 years, untreated dyspepsia for six weeks (asymptomatic at time of interview)	40 (5)
Patient under 40 with single episode of dyspepsia lasting two weeks	43 (5)
Uncomplicated heart burn responding to treatment	64 (7.9)
Uncomplicated duodenal ulcer shown on barium study responding to H <sub>2</sub> receptor antagonists	91 (11.2)
Duodenal scarring on barium studies responding to H <sub>2</sub> receptor antagonists	111 (13.8)
Patient under 40 years with dyspepsia who has had a negative endoscopy result in past two years	184 (22)
Follow up endoscopy after gastrectomy in patient without symptoms	188 (23.3)
Patient under 40 years with mild to moderate gastro-oesophageal reflux only	231 (28.6)
Follow up to previous endoscopic findings of non-ulcer dyspepsia in patient with symptoms	238 (29.5)
Metastatic adenocarcinoma of unknown primary site	316 (39)
Patient under 40 years with dyspepsia who has had a negative barium meal result in past two years	408 (50.6)
Evaluation of occult blood in stool, before lower gastrointestinal work up performed	461 (57.7)
Patient under 40 years, with a 2-6 month history of untreated dyspepsia	492 (61)
Patient with chronic non-progressive dyspepsia probably functional in origin	515 (63.8)
Patient over 60 years with anorexia, early satiety or weight loss with normal barium meal result	573 (71.1)
Patient over the age of 40 years with a 2-6 month history of untreated dyspepsia	703 (87.2)
Patient with anaemia (haemoglobin < 10g/l) taking long term non-steroidals for chronic arthritis	717 (88.9)
Patient with dyspepsia and large volume vomiting	748 (92.8)
Patient over 60 years with anorexia, early satiety or weight loss; barium meal not performed	760 (95)
Heartburn which has failed to respond adequately to maximal medical treatment	774 (96)
Patient with dyspepsia who continues to have symptoms despite H <sub>2</sub> antagonists, who has not had any investigations of the upper gastrointestinal tract	781 (96.8)
Patient with progressive dysphagia	783 (97)
Follow up double contrast barium meal showing a gastric ulcer	787 (97.6)
Patient with haematemesis	801 (99)

\*Not all doctors answered every question.

*Patients over the age of 45 with a recent onset of dyspeptic symptoms or change in dyspeptic symptoms—* These patients should have endoscopy at an early stage so as not to miss gastric cancer.<sup>11</sup> This disease is the fourth commonest lethal malignancy in England and Wales, accounting for over 10 000 deaths a year. Surgery has most benefit in patients with early gastric cancer—that is, where the lesion is confined to the mucosa and submucosa but not invading the muscularis propria.<sup>12-14</sup> Such patients present with mild symptoms that are often indistinguishable from benign disease.<sup>15</sup> In the United Kingdom cancer is rare under the age of 45. The American computer system would prefer all patients with dyspepsia to receive a trial of treatment first. This argument was rejected by the British audit panel on the basis that the symptoms of cancer may respond to acid suppression thus delaying diagnosis. Indeed, in the 390 cases selected for analysis one patient with gastric cancer was regarded as inap-

appropriate for endoscopy by the American computer system but would have had cancer identified using the criteria of British audit panel. One reason for the difference of approach between the two countries may be that gastric cancer is less common in the United States than in Britain.

*Patients under the age of 45 with dyspepsia who are positive for Helicobacter pylori on non-invasive testing or who have other risk factors such as treatment with non-steroidal anti-inflammatory drugs*—The main reason for endoscopy in this group is to diagnose gastroduodenal ulcer. Infection with *H pylori* is responsible for over 95% of duodenal ulcers and most gastric ulcers, and eradication of the bacteria leads to long term cure.<sup>16</sup> Infection can be detected by a simple blood test, which is available in most hospitals. Five recent studies in Britain have assessed the predictive value of serological testing for *H pylori*,<sup>17-21</sup> and all have confirmed that the likelihood of finding serious organic disease (duodenal ulcer, gastric ulcer, and gastric cancer) is small in those who are serologically negative and who are not taking non-steroidal anti-inflammatory drugs.

*Patients in whom continuous long term treatment with H<sub>2</sub> receptor antagonists, acid pump inhibitors, or prokinetic drugs is planned*—Table II shows the cost of long term treatment with five drugs commonly prescribed for non-specific dyspeptic symptoms or gastro-oesophageal reflux disease. Long term treatment is expensive and in many cases unnecessary. Firm evidence that no serious disease is present may avoid the need for long term treatment. Conversely, it is desirable to know whether a patient has ulcerative oesophagitis, early stricturing, or a Barrett's oesophagus because these findings may influence management.

*Patients under the age of 45 with no H pylori infection but severe and persistent symptoms that do not respond to treatment*—Uncommon gastroduodenal conditions may affect this age group, including gastric cancer, gastric lymphoma, leiomyoma, erosive gastritis, and *H pylori* negative peptic ulcer. This was reflected in the fact that 97% of respondents to our questionnaire thought that endoscopy was appropriate for patients with resistant dyspepsia.

### Inappropriate indications for endoscopy

Box 2 also lists the clinical situations in which endoscopy is inappropriate. The commonest reason the panel found for endoscopy being inappropriate was a clear history of irritable bowel syndrome without features of ulcer disease (30%). Typical symptoms of irritable bowel syndrome are abdominal distension, relief of pain with bowel movement, loose stools associated with pain, frequent stools with onset of pain, mucus passed per rectum, feeling of incomplete evacuation.<sup>22</sup>

Mild or moderate reflux symptoms may respond to simple measures such as change in lifestyle, antacids,

and alginates. The changes in lifestyle to be considered include weight reduction, stopping smoking, avoidance of foods that precipitate symptoms, and if possible stopping any drugs that are associated with dyspepsia—for example, corticosteroids, non-steroidal anti-inflammatory drugs, and potassium chloride. Very heavy meals and excessive alcohol should also be avoided, and if symptoms are present at night the patient should be encouraged to eat earlier in the evening.

Patients who have had one episode of dyspepsia but are subsequently free of symptoms and taking no drugs were not considered appropriate for endoscopy by the audit panel of judges. In addition this was the second commonest reason for non-approval in the computer analysis.

### Cancer screening or surveillance

Use of endoscopy to screen for cancer is a controversial area. Screening of patients with pernicious anaemia and surveillance of the stomach after surgery have been extensively analysed and regular endoscopy is probably not merited.<sup>26-28</sup> Screening is common for Barrett's oesophagus and in patients with familial adenomatous polyposis (to detect gastroduodenal cancer), but no authoritative analysis exists to support this.

### Cost effectiveness

Resource constraints have in the past tended to result in endoscopy being deferred as long as possible. However, up to 70% of all patients with persistent dyspeptic symptoms have either a barium meal examination or endoscopy at some stage,<sup>27</sup> and it may be clinically and financially more appropriate to investigate earlier rather than later. This view is supported by clinical trials from Australia and Denmark in which empirical treatment followed by endoscopy (when necessary) was compared with early endoscopy followed by appropriate treatment.<sup>28,29</sup> At six months no difference was apparent in the clinical and financial outcomes in the Australian study while after one year the Danish paper found a cost advantage for early endoscopy. A computer model study from Sweden also found that early endoscopy had the financial edge over deferred investigation.<sup>30</sup> There may also be clinical advantage in the early detection of premalignant lesions or early gastric cancer in patients whose dyspepsia is investigated promptly.<sup>11</sup>

We believe that didactic recommendations cannot be made in a subject as non-specific as dyspepsia. Decision making must take account of the patient—for example, some patients with intermittent dyspepsia responding to simple treatment may be very worried that their problem has a serious underlying cause. If a doctor is unable to dispel a patient's concern by careful explanation and reassurance, endoscopy may be warranted.

Endoscopy must stand up to rigorous audit. The view that any upper abdominal symptom should be investigated in the first instance by endoscopy should be resisted. The procedure is expensive, somewhat unpleasant for the patient, and carries a small risk of complications. The cost and risk must be carefully weighed against the potential advantage. Nevertheless, the management of dyspepsia is rapidly changing with newer tests, newer concepts concerning the pathogenesis of dyspepsia, and more effective and powerful drugs. These recommendations will require modification in the light of changing circumstances.

The members of the joint committee were H Brendan Devlin (chairman), J D Hardcastle, Royal College of

TABLE II—Costs of treatment and investigation

Drug	Recommended dose	Cost/30 days (£)	Cost/year (£)
Cimetidine:			
Tagamet	800 mg twice daily	45.24	542.88
Generic		20.04	240.48
Ranitidine	300 mg twice daily	54.86	658.32
Omeprazole	20 mg once a day	37.98	455.76
	40 mg once a day	75.96	911.52
Cisapride	20 mg twice daily	37.60	451.20
Gaviscon	10 ml four times a day	6.46	77.52
	20 ml four times a day	12.91	154.92
Lansoprazole	30 mg once a day	35.74	428.91

The cost of endoscopy to general practitioner fundholders for 1994-5 was provisionally set at £208 (United Leeds Teaching Hospitals Trust).

The cost of a carbon-13 breath test is about £28.20.

The cost of serological testing for *H pylori* (Porton-Cambridge ELISA) is about £9.

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We thank Miss C McCourt and Miss C Brizzolara, administrative assistants for the British Society of Gastroenterology and the Royal College of Surgeons, for their help in preparing this paper and Mrs A Scales for typing the manuscript.

- Heatley RV, Rathbone BJ. Dyspepsia: a dilemma for doctors? *Lancet* 1987;i:779-81.
- Talley NJ, Weaver AL, Tesmer DL, Zinmeister AR. Lack of discriminant value of dyspepsia subgroups in patient referred for upper endoscopy. *Gastroenterology* 1993;105:1378-86.
- Colin-Jones DG. Management of dyspepsia: report of a working party. *Lancet* 1988;i:576-9.
- Talley NJ, Colin-Jones D, Koch LK, Koch M, Nyren O, Stanghellini V. Functional dyspepsia: a classification with guidelines for diagnosis and management. *Gastroenterol Int* 1991;4:145-60.
- Heading RC. Definitions of dyspepsia. *Scand J Gastroenterol* 1991;180:1-6.
- Jones RH, Lydeard SE, Hobbs FSR, Kenkre JE, Williams EI, Jones SJ, et al. Dyspepsia in England and Scotland. *Gut* 1990;31:40-5.
- Jones R. What happens to patients with non-ulcer dyspepsia after endoscopy? *Practitioner* 1988;232:75-8.
- Quine MA, Bell GD, McCloy RF, Devlin HB, Hopkins A. Appropriate use of upper gastrointestinal endoscopy—a prospective audit. *Gut* 1994;35:1209-14.
- Brook RH, Park RE, Chassin M, Solomon D, Kessey J, Koscoff J. Predicting the appropriate use of carotid endarterectomy, upper gastrointestinal endoscopy and coronary angiography. *N Engl J Med* 1990;323:1173-7.
- Chassin M. In: Hopkins A, ed. *Appropriate investigations and treatment in clinical practice*. London: Royal College of Physicians, 1989:21-9.
- Hallisey MT, Allum WH, Jewkes AJ, Ellis DJ, Fielding JWL. Early detection of gastric cancer. *BMJ* 1990;301:513-5.
- Maruyama K, Okabayashi K, Kinoshita T. Progress in gastric cancer surgery in Japan and its limits of radicality. *World J Surg* 1988;11:418-25.
- Sue-Ling HM, Martin I, Griffith J, Ward DC, Quirke P, Dixon MF, et al.

- Early gastric cancer: 46 cases treated in one surgical department. *Gut* 1992;33:1318-22.
- Sue-Ling HM, Johnston D, Martin IG, Dixon MF, Lansdown MR, McMahon MJ, et al. Gastric cancer: a curable disease in Britain. *BMJ* 1993;307:591-6.
- DeDombal FT, Price AB, Thompson H, Williams GT, Morgan AG, Softley A, et al. The British Society of Gastroenterology early gastric cancer dysplasia survey: an interim report. *Gut* 1990;31:115-20.
- Helicobacter pylori: causal agent in peptic ulcer disease? Working Party Report to the World Congresses of Gastroenterology, Sydney 1990. *J Gastroenterol Hepatol* 1991;6:103-40.
- Sobala GM, Crabtree JE, Pentith JA, Rathbone BJ, Shallcross TM, Wyatt JL, et al. Screening dyspepsia by serology to Helicobacter pylori. *Lancet* 1991;338:94-6.
- Collins JAS, Bamford KB, Sloan JM, Collins BJ, Moorehead RJ, Love AGH. Screening for Helicobacter pylori antibody could reduce endoscopy workload in young dyspeptic patients. *European Journal of Gastroenterology and Hepatology* 1992;4:991-3.
- Mendall MA, Goggin PM, Marrero JM, Molineaux N, Levy J, Badre S, et al. Role of Helicobacter pylori serology in screening prior to endoscopy. *European Journal of Gastroenterology and Hepatology* 1992;4:713-7.
- Morgan AG, Crabtree JE, Heatley RV, Godwin PGR. Role of Helicobacter pylori serology in the initial assessment of patients with dyspepsia [abstract]. *Gut* 1991;32:T98.
- Johnston BJ, Reed PI, DG Newell. How to reduce the endoscopic workload. *Gut* 1990;3:A613.
- Manning AP, Thompson AG, Heaton KW, Morris AF. Towards a positive diagnosis of the irritable bowel. *BMJ* 1978;2:653-4.
- Fischer A, Graem N. Gastric stump carcinoma is prophylactic screening indicated. *Acta Chirurgica Scandinavica* 1988;547(suppl):86-7.
- Logan RFA, Langman MJS. Screening for gastric cancer after gastric surgery. *Lancet* 1983;ii:667-70.
- The role of endoscopy in the surveillance of premalignant conditions of the upper gastrointestinal tract. *Gastrointest Endosc* 1988;34:18S-20S.
- Offerhaus GJA, Tersmette AC, Giardiello FM, Huibregtse K, Bandenbroucke JP, Tytgat GNJ. Evaluation of endoscopy for early detection of gastric-stump cancer. *Lancet* 1992;340:33-5.
- Nyren O, Lindberg G, Lindstrom E, Marke LA, Seensalu R. Economic costs of functional dyspepsia. *Pharmacoeconomics* 1992;1:312-24.
- Goulston KJ, Dent OF, Mant A, Logan J, Ngu M. Use of H2 receptor antagonists in patients with dyspepsia and heartburn: a cost comparison. *Med J Aust* 1991;155:20-6.
- Bytzer P, Moller Hansen J, Schaffalitzky de Muckadell OB. Empirical H2-blocker therapy or prompt endoscopy in management of dyspepsia. *Lancet* 1994;343:811-6.
- Lindberg G, Lindstrom E, Marke LA, Nyren O, Seensalu R. *Gastroskopi—vid utredning av ont i magen*. Stockholm: Swedish Council on Technology Assessment in Health Care, 1990.

(Accepted 12 December 1994)

## An Ethical Debate

### Genetic testing for familial hypertrophic cardiomyopathy in newborn infants

#### Clinicians' perspective

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*Identification of genes for hypertrophic cardiomyopathy has made preclinical diagnosis possible in families with a mutation. As yet, however, no treatment prevents the development of myocardial hypertrophy, and medical intervention has not been shown to improve prognosis. A team from Hammersmith Hospital carrying out research into genetic causes of the disease report that they were asked by a couple to screen their daughter at birth. The couple also give their view of screening. We asked two medical geneticists, a cardiologist, and a paediatrician with an interest in ethics to comment on the implications.*

Hypertrophic cardiomyopathy is inherited as an autosomal dominant but has considerable genetic and phenotypic heterogeneity.<sup>1,2</sup> Clinical screening is inaccurate. Several patients from affected families in whom the diagnosis had previously been excluded by electrocardiography and echocardiography have since been shown to have a mutation of the cardiac  $\beta$  myosin heavy chain gene MYH7.<sup>3</sup> Once a mutation of MYH7 has been identified in a family genetic testing is relatively simple and accurate.<sup>4</sup>

Genetic or clinical screening of asymptomatic people is contentious as no intervention has been definitively proved to alter prognosis.<sup>5,6</sup> We report the genetic testing of a newborn infant enabling preclinical diagnosis of hypertrophic cardiomyopathy.

#### Case history

John (individual III-5) had hypertrophic cardiomyopathy diagnosed at the age of 24 during clinical family screening initiated after diagnosis of his sister (figure). He was asymptomatic but had evidence of asymmetric septal hypertrophy on echocardiography, with a septal wall thickness of 24 mm. Subsequently, a mutation in exon 13, codon 403 of MYH7 was detected in this family as part of a study aiming to identify genetic defects giving rise to hypertrophic cardiomyopathy. This study had been approved by the hospital ethics committee and all family members gave informed consent after receiving advice from trained counsellors regarding the consequences of screening. The family were informed a mutation had been

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BMJ 1995;310:856-9